

**COMSTAC**

**Technology and Innovation Working Group**

**2000 Commercial GSO Launch Demand Model**

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Technology and Innovation Working Group

# **Launch Demand Model Panel Membership**

- **Michael Izzo (Panel Co-Chair)**
- **Don Mac Kenzie (Panel Co-Chair)**
- **Bernard Hawkins**
- **Joe Hopkins**
- **Bob Cowls**
- **Barbara Billeter**
- **Henry Minami**
- **Doug Howe**
- **Brett Alexander**
- **Gary Lai**
- **Larry North**
- **Josh Hopkins**
- **Darren Chambo**
- **Ethan Haase**
- **David Keslow**
- **James Brown**
- **Tom Solitario**
- **Larry Mattson**

**Lockheed Martin Commercial Space Systems**  
**Hughes Space & Communications**  
**Aerospace Corporation**  
**Andrews Space and Technology**  
**Boeing Commercial Space**  
**Boeing Commercial Space**  
**Boeing - Rocketdyne Propulsion & Power**  
**Boeing Commercial Space**  
**FAA/AST**  
**Kistler Aerospace**  
**Lockheed Martin Astronautics**  
**Lockheed Martin Astronautics**  
**Lockheed Martin Astronautics**  
**Lockheed Martin - Int'l. Launch Services (ILS)**  
**Orbital Sciences Corporation**  
**Pratt & Whitney**  
**Space Systems/Loral**  
**TRW**

# 2000 Survey

- Survey letter sent to 55 industry organizations
- Responses provided by 20 spacecraft manufacturers, operators and launch service providers for the 2000 - 2010 planning horizon
- Respondents were asked to segregate their forecast into weight categories (separated mass inserted into a nominal GTO, assuming launch at 28° inclination)
  - Four weight categories:
    - Below 4,000 lb. (<1,815 kg)
    - 4,000 - 9,000 lb. (1,815- 4,083 kg)
    - 9,000-12,000 lb. (4,083 – 5,445 kg)
    - Above 12,000 lb. (>5,445 kg)
- Goal - Industry agreement on worldwide “demand” for addressable commercial GSO spacecraft launch services
  - Demand is a number of identified or projected programs expected to be launched
    - Not a prediction actual launches
    - Peak load if all projected satellite launches were executed.
  - The addressable market is the satellites that are open for internationally competitive launch service procurement.

## 2000 Survey Participants

- American Mobile Satellite Corp.
- Arianespace, Inc.\*
- Asia Satellite Telecommunications Company, Ltd.
- The Boeing Company\*
- Broadcasting Satellite System Corp (B-SAT)
- COMSAT
- Hughes Space & Communications\*
- ICO Global Communications
- Lockheed Martin Space Systems Company\*
- Motorola
- Optus Communication
- PanAmSat
- PT. Telekomunikasi Indonesia
- Rocket System Corporation
- Space Systems/Loral\*
- Shin Satellite Plc.
- Singapore Telecommunications Ltd.
- Sirius Satellite Radio
- Skynet/ SatMex/ EuropeStar
- Spectrum Astro

\* Denotes a comprehensive mission model forecast was provided

# Forecast Methodology

- **Near-term forecast - 2000-2002**

- Consensus forecast
- “Bottoms up” summary of 2000-2002 launch opportunities
- Published manifests
- Most likely satellite readiness date used for uncertain projects
- Timing and likelihood of new opportunities included by Working Group Members

- **Long-term forecast - 2003-2010**

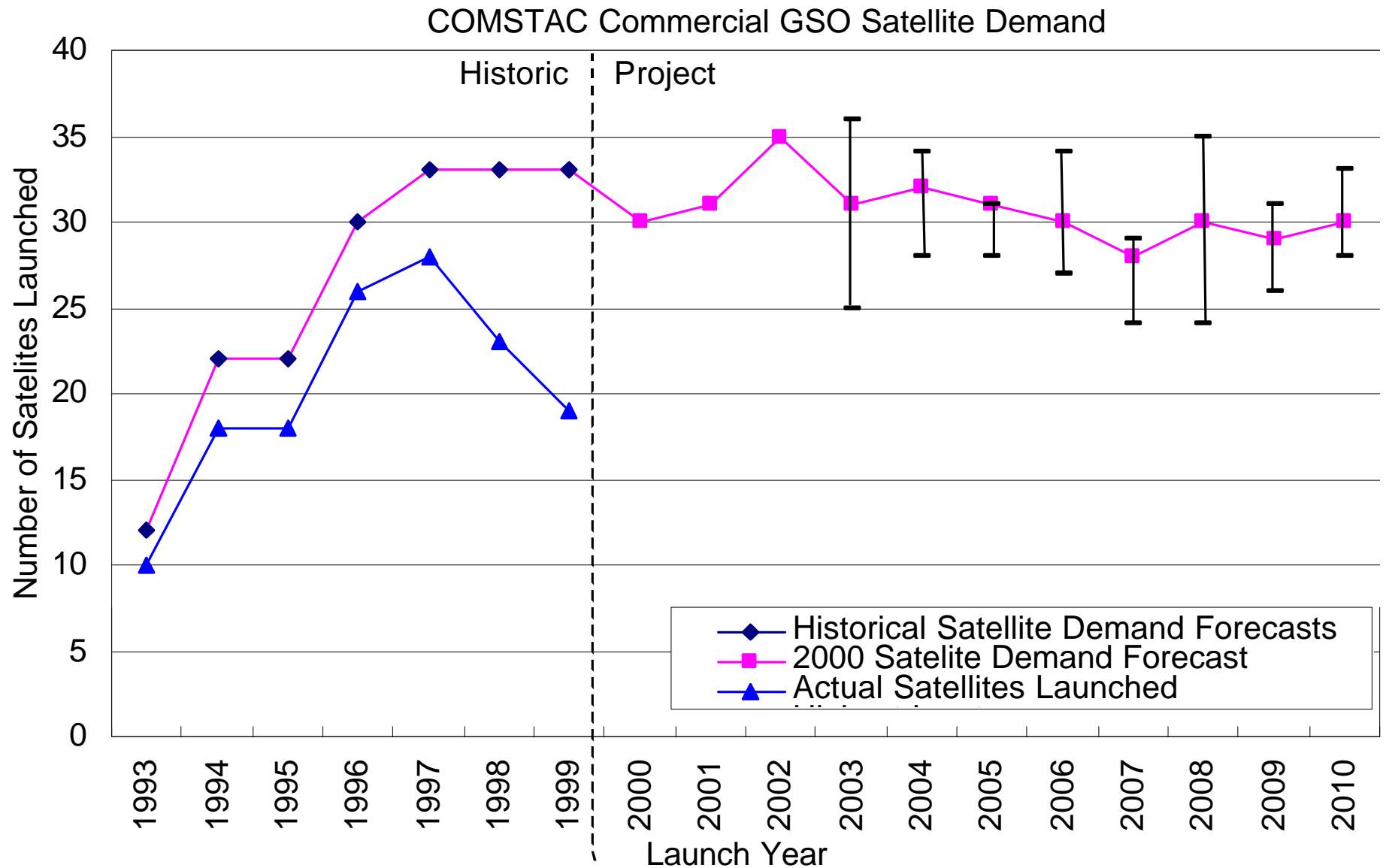
- Averaged forecast
- Planned programs and undefined future satellite procurements
- Replenishment of existing or soon-to-be launched systems
- “Unidentified Growth” opportunities and growth replenishment
- Attrition

## 2000 Results

- Near-term demand of 30, 31, and 35 satellites for 2000, 2001, & 2002 respectively
- Average annual satellite demand for launches is approximately 30.6 per year which translates into a launch demand of 23.5 per year

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total	Average 2000 to 2010
<b>Satellite Demand</b>	30	31	35	31	32	31	30	28	30	29	30	337	30.6
<b>Dual Launch Forecast</b>	4	5	5	6	7	8	9	8	9	9	9	79	7.2
<b>Launch Vehicle Demand Forecast</b>	26	26	30	25	25	23	21	20	21	20	21	258	23.5

# 2000 COMSTAC Commercial GSO Spacecraft Demand Model



**In 1999, COMSTAC predicted 33 satellites would be launched. There were only 19 satellites actually launched. Why were you so far off?**

- The COMSTAC forecast is *not a prediction* of actual satellites to be launched
- Terminology that need to be distinguished:
  - Satellite demand
  - Launch demand
  - Actual satellites launched
  - Actual number of launches
- The satellite demand is the number of identified or projected satellites that *can be* launched in that year
  - Peak load if all projected satellites are launched
  - A driver for the size of the competitive launch market
  - Not prediction actual launches
- The launch demand is projected after the number of dual launches were determined

# 1999 Satellite Demand vs Actual Launched

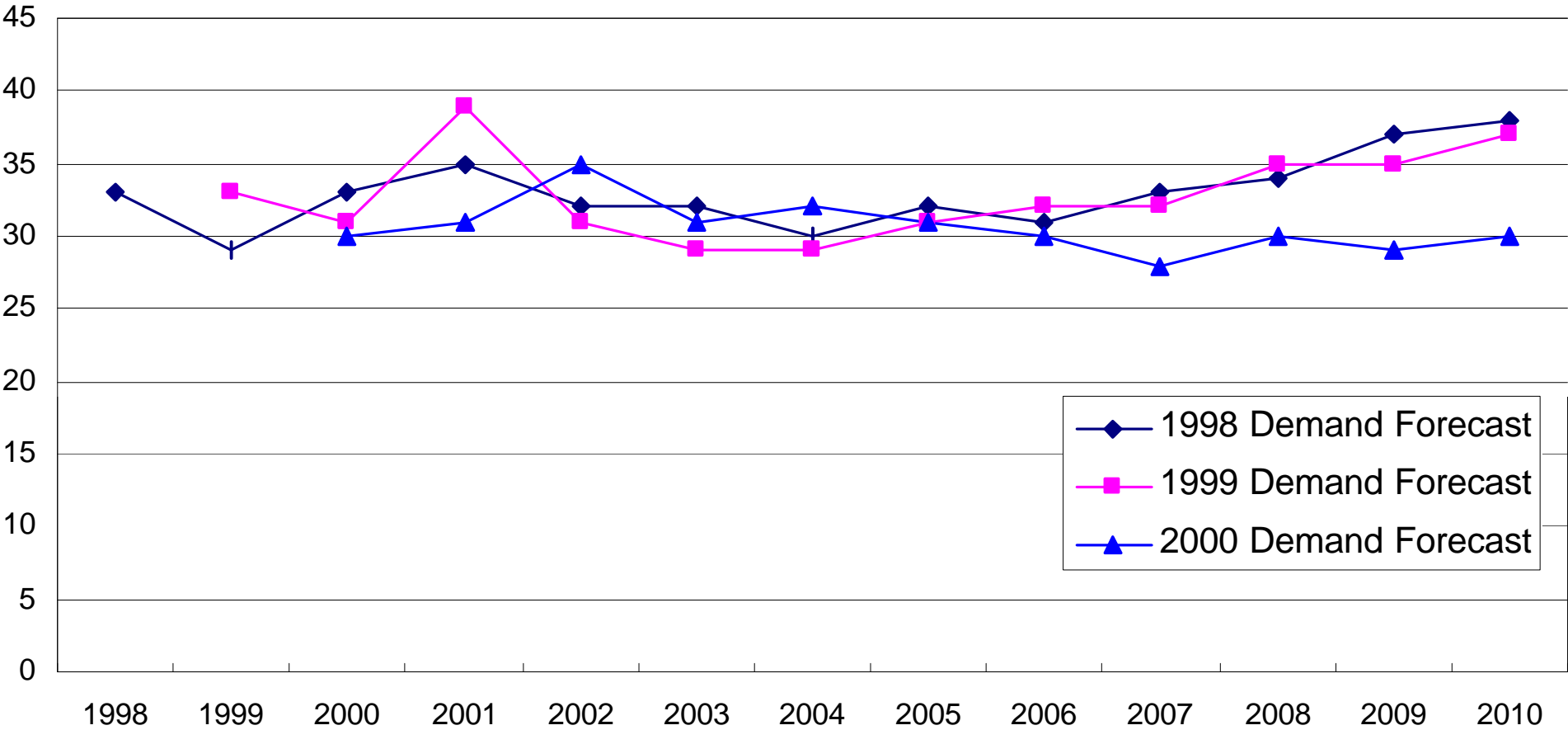
- Space industry *execution* on the demand determines the actual number of launches
- Several factors may affect the execution of launches. These include:
  - Satellite manufacturer delays
  - Launch provider delays
  - Government regulatory issues
  - Customer financing or business priority issues
- The COMSTAC Mission Model demand was 33 satellites for 1999
  - 19 satellites were launched
  - 5 satellites were delayed due to launch vehicle issues
    - 3 satellites were launched late due to launch vehicle manifesting issue
    - 1 satellite experienced a delay due to a dual manifesting issue
    - 1 satellite changed launch vehicles due to a failure
  - 6 satellites were delayed due to factory issues
  - 2 satellites were delayed due to regulatory issues (Export compliance and FCC license)
  - 1 satellite was canceled by customer
- The COMSTAC “satellite demand” for 1999 was on target

# **2000 to 1998 and 1999 COMSTAC Satellite Demand Survey Results**

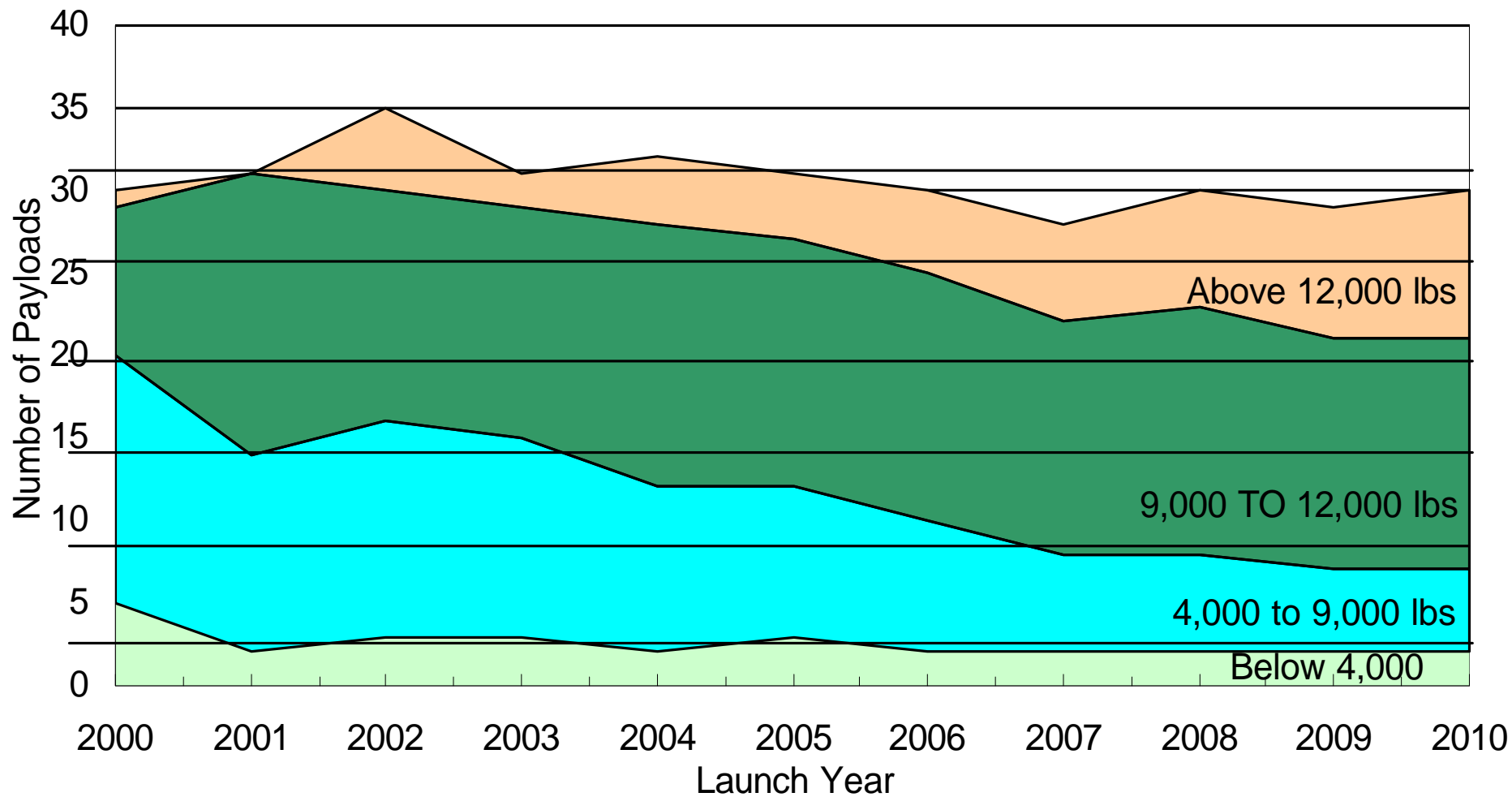
- 2000 average annual demand of 30.6 is approximately 10% below the 1998 and 1999 average annual demand of 33
- Several factors may be causing a reduction in the demand for satellites in the future. Some of these factors include:
  - Consolidation in the space industry
    - Manufacturers and service providers
    - Merging business plans reduces need for satellites
  - Satellite life
    - Extended life on existing satellites
    - Requirements for longer life on new procurements
  - Trend toward larger satellites
    - Increased functionality reducing the number of satellites needed
  - Growing conservatism in the space industry due to recent bankruptcies

# 1998-2000 COMSTAC Satellite Demand Comparison

1998,1999, 2000 Satellite Demand Forecasts



# Forecast Trends in Annual GSO Payload Mass Distribution



# Summary

- The 2000 COMSTAC Commercial Demand forecast overall shows a slightly lower, more conservative future
  - The near-term forecast for 2000 through 2002, shows 30 satellite programs to be launched in 2000, 31 in 2001, and 35 in 2002
  - Average demand of 30.6 satellites to be launched per year over the period from 2000 through 2010
  - Approximately a 10% decrease in forecasted demand as compared to 1998 and 1999 forecasts
  - After dual launch considerations, launch vehicle demand was determined to be 26 launches for 2000, 26 launches for 2001, and 30 launches for 2002 with an average annual launch demand of 23.5 per year
- Several factors may be causing a reduction in the demand for satellites in the future including industry consolidation, extended satellite life, and conservatism in the space industry
- The future of the launch industry foresees some potential market changing events including
  - Inaugural flights of several new launch vehicles
  - First use of newly designed major components
  - US government's regulatory environment